IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
Before the Board of Patent Appeals and Interferences

In re Patent Application of: BURDASS
Serial No. 10/798,890
Filed: March 12, 2004
Title: PREFETCHING EXCEPTION VECTORS

Atty Dkt. SCS-550-530
C# M#
TC/A.U.: 2183
Examiner: B. Johnson
Date: December 3, 2007

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

☐ **Correspondence Address Indication Form Attached.**

☐ **NOTICE OF APPEAL**
Applicant hereby **appeals** to the Board of Patent Appeals and Interferences from the last decision of the Examiner twice/finally rejecting applicant's claim(s). $510.00 (1401)/$255.00 (2401) $

☐ An appeal **BRIEF** is attached in the pending appeal of the above-identified application $510.00 (1402)/$255.00 (2402) $

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☒ A reply brief is attached. **(no fee)**

☐ Petition is hereby made to extend the current due date so as to cover the filing date of this paper and attachment(s)
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Any future submission requiring an extension of time is hereby stated to include a petition for such time extension. The Commissioner is hereby authorized to charge any deficiency, or credit any overpayment, in the fee(s) filed, or asserted to be filed, or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our **Account No. 14-1140.** A duplicate copy of this sheet is attached.

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BURDASS — Atty. Ref.: SCS-550-530

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REPLY BRIEF

This Reply Brief is responsive to the Examiner's Answer mailed October 3, 2007, the date of response to which is December 3, 2007.

Appellant responds to the Examiner's admissions and continued failure to identify claimed subject matter and claimed interrelationships in the cited prior art references and will follow the organization of the Appeal Brief.

A. The Examiner fails to identify where the Birk reference teaches "upon completion of execution of said current program instruction . . ."

First, the Examiner's confirmation of admissions made in the Final Rejection (confirmations at sections 7 and 8 of the Examiner's Answer) is very much appreciated.

On page 6 of the Examiner's Answer, the Examiner inaccurately quotes Appellant's Appeal Brief, blending paragraphs together and changing the emphasis provided to various portions of the Appeal Brief argument (the Examiner emphasizes "aborts the instructions" in his purported quotation and ignores the Appeal Brief emphasis under the phrase "it aborts the instruction").

However, disregarding these format errors, the Examiner confirms Appellant's quote from the Birk reference, column 3, lines 59-63, which discloses that "upon detection of an interrupt, it aborts the instruction which generated the cache line miss and begins execution of the interrupt service routine." Rather than identifying some portion of the Birk reference which somehow modifies or teaches away from the above-quoted portion of Birk, the Examiner alleges that "to suggest that an instruction is never completed is completely contrary to the teachings of Birk and the knowledge of one of ordinary skill in the art of instruction processing."

Because the Examiner can identify no disclosure of Appellant's claimed exception controller (and the claimed interrelationship "upon completion of execution of said current program instruction . . ."), the Examiner apparently believes that one of ordinary skill in the art would somehow disregard this teaching and instead assume that the instruction would be reissued and thereafter completed.

The Examiner's allegation of "inherency" is simply unsupported by any evidence of record in the prosecution of this application. Appellant has repeatedly pointed out that the Birk reference fails to teach major elements and interrelationship between elements recited in Appellant's independent claim 1. As set out in the Appeal Brief, the Examiner

has repeatedly failed to identify any portion of the Birk reference teaching the missing elements and interrelationships. Now at this late date, the Examiner now appears to rely upon an allegation that somehow the claim limitations are inherent in the cited prior art and would be obvious to those of ordinary skill in the art in view thereof simply does not provide any evidence of anticipation or obviousness upon which the Examiner may rely in any further rejection of independent claims 9 and 24 or claims dependent thereon.

Even more significantly, in the Examiner's "Second part" discussion in the Examiner's Answer, he admits that "**the 'if' limitation of the claim is never met by Birk.**" (the underline emphasis in the original, the bold emphasis added). This, in the last paragraph of section A on page 8 of the Examiner's Answer, is an admission that Birk cannot possibly teach the claimed exception controller, i.e., one which, "upon completion of execution of said current program instruction, **if said exception is till current**, then said instruction prefetch unit fetches said exception handling program instruction from said cache memory" (emphasis added). The Examiner's statement that the "if" limitation is never met by Birk is a clear admission that Birk cannot possibly contain any disclosure of the claimed "exception controller" in claim 9.

In view of the above, Appellant' argument in section A of the Appeal Brief has not been rebutted and indeed, in view of the Examiner's admissions, clearly points out the absence of claimed structures and structural interrelationships which are missing from the prior art thereby confirming the impropriety of any rejection of claims 9 and 24 (and claims dependent thereon) under the provisions of 35 USC §102 or §103 over the Birk reference.

B. The Examiner's assertion on page 3, first full paragraph, is completely unsupported by the Birk reference and has been withdrawn by the Examiner

In section B of the Examiner's Answer (bridging pages 8 and 9), the Examiner suggests that the paragraph at issue is "confusing." Appellant did not allege that the Examiner's Answer was confusing, but rather, that the Birk reference simply did not support the contention made by the Examiner in the paragraph. The Examiner's withdrawal of the comment in the Final Rejection is very much appreciated and is believed to obviate any basis for the §§102 and 103 rejections based upon this paragraph.

However, it should be noted that the portion of the Appeal Brief detailing the error in the Final Rejection (which the Examiner has now withdrawn) contains an accurate discussion of the Birk reference and its related disclosure which is not rebutted by the Examiner at all. Appellant points out that the whole point of the Birk disclosure is to avoid the stall cycles associated with a miss in the cache memory. Birk suggests that if a miss occurs during the execution of a normal program instruction from a given program thread, this should trigger processing to be started from another program thread so that the stall associated with the cache miss can be avoided. In order to achieve this desired behavior, which is the whole reason for the arrangement of Birk, it is necessary that the instruction of the interrupt service routine (ISR) or the different thread should be present within the cache memory and not itself result in a second cache miss. There is simply no

point in using the system of Birk if one cache miss is avoided merely to result in another cache miss.

Thus, because the Examiner does not traverse or otherwise rebut Appellant's discussion of the Birk reference, it will be assumed that the Examiner appreciates, understands and agrees with the Appeal Brief interpretation of Birk.

C. The Examiner continues to misapprehend claims 9 and 24 and ignore the "if . . . , then . . ." conditionality expressed therein

Again, the Examiner refuses Appellant's invitation to identify where in the Birk reference all claimed features of independent claims 1 and 24 are disclosed. The feature discussed is the exception controller which utilizes the "if . . . , then . . ." conditionality.

Instead of disclosing where Birk contains the Appellant's claim limitations, the Examiner provides a straw-man argument with the "John goes to the store" analogy. The Examiner's theory is that if one considers the phrase "[i]f John goes to the store today then he will purchase bread," but if he actually chooses not to go to the store, the claim statement "is not rendered incorrect by the actions of John."

The Examiner's analogy is bogus because it does not reflect the subject matter of Appellant's claim, i.e., that there is a apparatus mechanism (the exception controller in Claim 9) or specific method step (the "triggering" step in claim 24) that will accomplish specific interrelationships "if said exception is still current upon completion of execution of said current program instruction."

Thus, a more applicable version of the Examiner's analogy would be – "if John goes to the store today, then the machine will automatically purchase bread." Even if John does not choose to go to the store, the machine which will "automatically purchase bread" still exists. It is the latter structure which is recited in Appellant's independent claims 9 and 24, i.e., a structure and method step which, upon completion of execution and if execution is still current, insures that the certain other actions will take place.

As noted in the Appeal Brief, the structure and method steps are clearly missing from the Birk reference and the Examiner has not identified any structure in the Birk reference or any other reference which would provide this exception controller structure and claimed structural interrelationship. As a result, it is clear that Birk does not teach Appellant's claimed exception controller element or the triggering step in claims 9 and 24, respectively.

The Examiner's final statement on this matter on page 10, line 5 is to say that the claim somehow does not require "upon completion of execution of said current instruction" there must be a determination as to "if said exception is still current" with actions happening as a result of the completion. The Examiner admits that "**in Birk, it never is**" (emphasis added) signaling that the Birk reference can never operate in the manner of Appellant's claimed exception controller.

D. The Examiner ignores the requirement that he provide some "reason" or "motivation" for combining Birk and the secondary references

Instead of identifying any "reason" or "motivation" for combining the references, the Examiner merely states that "this is simply common sense" to combine the elements from the Birk and Glass references. The Examiner's suggestion that Birk teaches an improvement of "throughput of cache-based embedded processors" and Glass's teaching of an "increase in speed" in an integrated circuit would make it obvious to combine elements of the Birk and Glass references in the manner of Appellant's independent claims. However, neither Birk nor glass are directed to the problems solved by Appellant's claimed invention.

There is no suggestion in Birk that there is any benefit in providing the device in the form of an integrated circuit. In the Glass reference, there is no suggestion or discussion of exception handling. As a result, there is no suggestion that the problems noted in Appellant's specification could be addressed and/or solved by combining portions of Birk with portions of the Glass reference.

As the Court of Appeals for the Federal Circuit has consistently held, the Examiner may not merely pick and choose elements from the separate references and then combine them in the manner taught only by Appellant's claims. The Examiner's actions in the Examiner's Answer are essentially pointing out some benefit (which must be present in all issued patents) as the required "reason" or "motivation" for combining

portions of patents. If this were the test of obviousness, then all issued patents, by definition would be automatically combinable with each other.

The above is simply not the test of obviousness and the Examiner has failed to properly supplement the Final Rejection to create a *prima facie* basis of obviousness.

E. The Examiner continues to ignore the fact that Birk teaches away from Appellant's claimed combinations

In section E, the Examiner's primary argument is not the traversal of Appellant's discussion of how and why the Birk reference would lead one of ordinary skill in the art away from the invention. Instead, the Examiner attempts to characterize the discussion as simply repeating "the arguments of the anticipatory rejection discussed in (A) and (C)."

However, in the two paragraphs from section E of Appellant's Brief quoted in the Examiner's Answer, it is clear that Birk does not teach "upon completion of execution of said current program instruction" and instead discloses that in Birk "upon detection of an interrupt, it aborts the instruction which generated the cache line miss . . . ." (Column 3, lines 60-62). Appellant is not merely repeating the argument that Birk does not teach Appellant's claim limitations.

Instead, Appellant has clearly stated in the Appeal Brief that the Birk reference teaches the direct opposite of the claims. Birk teaches that the instruction is **not to be completed** (when it is "aborted"), whereas Appellant's claims specify "upon completion of execution." In the Examiner's mind, this may be a mere recitation of arguments

contained in sections A and C. However, sections A and C, Appellant is pointing out that Birk does not teach the claim limitations. In section E, Appellant is pointing out that Birk actually would lead one of ordinary skill in the art away from Appellant's claimed combination of elements and recited interrelationships – two completely different arguments.

The Examiner also attempts to avoid the contrary teaching of Birk by suggesting that "Nguyen was added because Birk fails to disclose a data abort and prefetch abort instruction. Glass was added for the disclosure of an integrated circuit. These additions have nothing to do with 'aborted instruction' discussed above; therefore, Birk does not teach away from these combinations."

However, one of ordinary skill in the art reading the simple language of the Birk invention would understand that its teaching is that one would not have an exception controller which checks to see **if** an exception is still current upon completion of execution of the current program instruction and **then** fetches exception handling program instructions from the cache memory as specified in Appellant's independent claims.

The Examiner again fails to "explain how or why one of ordinary skill in the art would ignore the contrary teaching of Birk when attempting to make the combination of Birk with either Nguyen or Glass in the rejections of claims 13-15 and 28-30." (Appeal Brief, page 14). The Examiner continues to avoid this issue raised in the Appeal Brief.

F-H. Subheadings F-H are not substantively responded to in the Examiner's Answer

In sections F-H of the Examiner's Answer, the Examiner adopts his prior arguments by reference, as did Appellant in the Brief. With reference to the §102 rejection, it is noted that Appellant relied upon the Brief arguments in sections A, B, C and E (not just A & C). While Appellant has already traversed the Examiner's contentions in sections A and C, the Examiner does not appear to have responded to the arguments set out in sections B and E.

In section G, the Examiner correctly responds by agreeing with Appellant's view that the anticipation rejection will be decided based upon whether or not the two claimed structures or structural interrelationships recited in the Appellant's claims and discussed in sections A and C are in fact disclosed in the Birk reference. In view of the noted admissions by the Examiner in the above sections A and C, this anticipation rejection clearly fails.

Instead of responding to section D and the allegation that there is no motivation for combining references, the Examiner merely references a portion of his Final Rejection relating to the Nguyen reference. However, the Appeal Brief argument is with respect to the motivation for combining Birk and the secondary references. As noted in section D above, the Examiner provides no reason for combining Birk and Nguyen. The Examiner does not provide any analysis or suggestion that the quoted portions from the Final Rejection comprise any reason why one would pick and choose elements from the

Birk and Nguyen references and then combine them in the manner of Appellant's independent claims.

With respect to the argument that Birk teaches away from the claimed invention, the Examiner relies upon his arguments in sections A and C, whereas Appellant notes that the Appeal Brief discussion is in section E, i.e., where the cited Birk reference teaches away from Appellant's claimed combination. The Examiner's reliance upon sections A and C which only point out that Birk fails to teach claimed elements, does not rebut the section E argument that Birk teaches away from the claimed invention.

Finally, with respect to section H, the failure to set out a *prima facie* case of obviousness in view of the combination of Birk and Glass, the Examiner makes the curious allegation that "[n]o specific limitations are traversed and no specific arguments are made exception for the motivation of the Birk/Glass combination." While Appellant has previously pointed out in sections A and C that Birk fails to disclose claimed subject matter, the fact that the Examiner has made no allegation that Glass supplies the disclosures missing from Birk is confirmation that even if Birk and Glass were combined, they cannot render obvious the subject matter of the claimed invention. Thus, the Examiner's missing the primary argument set out in section H is regretted.

SUMMARY

Thus, Appellant will rely upon the Appeal Brief and the above responses to the Examiner's Answer as clearly establishing failures on the Examiner's part to indicate where all missing structures and/or structural interrelationships and/or method steps claimed in independent claims 1 and 24 and claims dependent thereon are shown in either

the Birk or other cited prior art references. Without a disclosure of these claimed elements and interrelationships, there can be no anticipation of the claims.

Moreover, without the claimed limitations being disclosed at least one, amongst several, cited prior art references, there is no support for obviousness rejection based upon a combination of Birk and the other references. The Examiner's failure to appreciate that Birk would lead one of ordinary skill in the art away from the claimed invention is clear rebuttal to any *prima facie* obviousness rejection. The Examiner's failure to provide any reason or motivation for combining the Birk and other references in the manner of Appellant's claims is also fatal to any *prima facie* case of obviousness.

The fact that the Examiner admits that Birk never teaches the "if" limitation in Appellant's independent claims (see the admission on page 8, 3rd full paragraph of the Examiner's Answer) is a clear admission that claim limitations are not disclosed in Birk and there is no allegation that they are disclosed in any other prior art reference. The Examiner's admission that "in Birk, it never is" with respect to completion of execution of said current instruction required in Appellant's independent claims is also dispositive confirmation that Birk does not teach, and in fact teaches away from, limitations set out in Appellant's independent claims.

As a result of the above, there is simply no evidentiary support for the Examiner's rejections of Appellant's independent claims or claims dependent thereon under either 35 USC §102 or §103. Thus, and in view of the above, the rejection of claims 9-15 and 24-30 is clearly in error and reversal thereof by this Honorable Board is respectfully requested.

Respectfully submitted,

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